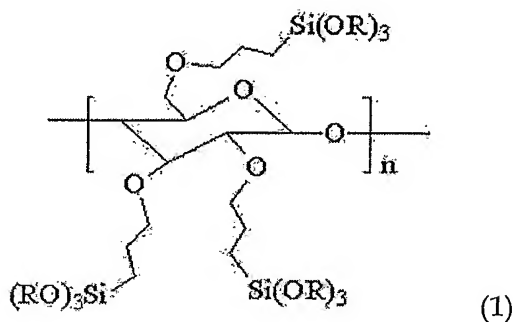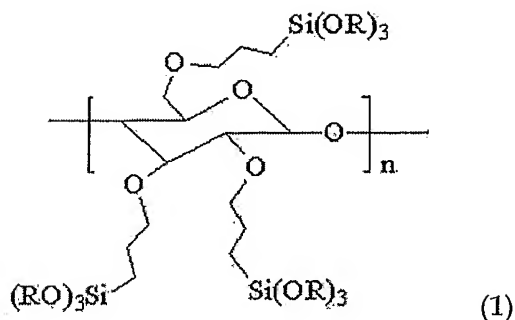**Claims**

1. Reactive nanoparticular porogen based on cyclodextrin derivative of the following formula 1 to be used as a porogen,

(1)

wherein R represents the same or different C_{1-6} alkyl group, respectively, wherein n is an integer of 6 to 12.
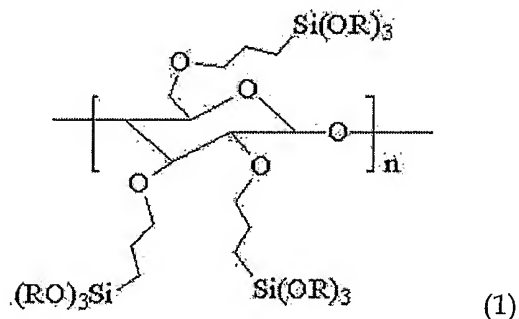
2. In claim 1, said derivative is selected from the group consisting of hexakis(2,3,6-tri-O-(3-trimethoxysilylpropyl)-α-cyclodextrin), hexakis(2,3,6-tri-O-(3-triethoxysilylpropyl)-α-cyclodextrin), heptakis(2,3,6-tri-O-(3-trimethoxysilylpropyl)-β-cyclodextrin), heptakis(2,3,6-tri-O-(3-triethoxysilylpropyl)-β-cyclodextrin), octakis(2,3,6-tri-O-(3-triethoxysilylpropyl)-γ-cyclodextrin), and octakis(2,3,6-tri-O-(3-trimethoxysilylpropyl)-γ-cyclodextrin).

3. A dielectric matrix manufactured by sol-gel reaction of a derivative of the following formula 1,

(1)

wherein R represents the same or different C_{1-6} alkyl groups, respectively and wherein n is an integer of 6 to 12.

5   4. A low dielectric film manufactured by thin-filming of said dielectric matrix, which is manufactured by sol-gel reaction of the following formula 1,
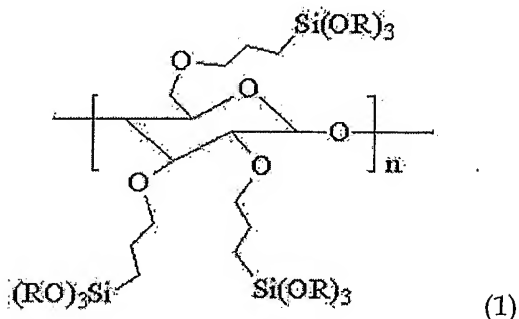

(1)

wherein R represents the same or different C_{1-6} alkyl groups respectively and n is an

10   integer of 6 to 12.

5. In claim 4, said dielectric matrix comprises a silicate precursor selected from polymethylsilsequioxane and polymethylsilsequioxane copolymer.

15   6. An ultralow dielectric composition comprising:

        a) an organic or inorganic silicate precursor, and

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b) a reactive nanoparticular porogen based on cyclodextrin derivative of the following formula 1,

$$(1)$$

wherein R represents the same or different C_{1-6} alkyl group, respectively and n is an integer of 6 to 12.

7. In claim 6, said ultralow dielectric composition is obtained by combining (a) said organic or inorganic silicate precursor and (b) said nanoparticle of a cyclodextrin derivative of the above formula 1, which are dissolved to have the equal concentration within the range of from 10 to 40 wt.%, with a mixing ratio of 10-50: 10-50 vol.% between the two solutions.

8. In claim 6, said derivative of the above formula 1 is an ultralow dielectric composition selected from the group consisting of hexakis(2,3,6-tri-O-(3-trimethoxysilylpropyl)-α-cyclodextrin), hexakis(2,3,6-tri-O-(3-triethoxysilylpropyl)-α-cyclodextrin), heptakis(2,3,6-tri-O-(3-trimethoxysilylpropyl)-β-cyclodextrin), heptakis(2,3,6-tri-O-(3-triethoxysilylpropyl)-β-cyclodextrin), octakis(2,3,6-tri-O-(3-triethoxysilylpropyl)-γ-cyclodextrin), and octakis(2,3,6-tri-O-(3-trimethoxysilylpropyl)-γ-cyclodextrin).

9. In claim 6, said dielectric matrix comprises a silicate precursor selected from polymethylsilsequioxane and polymethylsilsequioxane copolymer.

10. An ultralow dielectric films manufactured by thin-filming of any one of the ultralow dielectric compositions of claims 6 – 9, wherein the porosity is 21 to 51% and dielectric constant is 2.1 to 1.54 when the relative volume of the template solution with reference to the matrix solution is 40 to 49%.